

DETAILED ACTION

This Office Action is in response to amendment filed 9-27-11. Claims 1-7, 21-33 are presented for further examination.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 4, 21, 23, 28-31, 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Elzur (US Patent 6,427,169 B1) in view of Butts et al. (hereinafter "Butts", US Patent 6,233,543 B1).

As per claim 1, Elzur discloses an interface device for a computer, the interface device comprising:

- a hardware configured to process a transport layer header of a packet received via a first network port (column 2, lines 1-2, 43-47, 55-58, 64-67, column 3, lines 1-4, column 4, lines 40-45);
- A mechanism for associating said packet with said control information (column 4, lines 20-30, column 5, lines 5-10).

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- to send data from said packet via a second network port to a storage unit, thereby avoiding the computer (column 5, lines 59-65, column 6, lines 7-10, 42-52).

Elzur does not explicitly disclose:

- A memory storing a TCP connection established by the computer and handled by said device.

However, the use and advantages of storing a TCP connection is well-known to one of ordinary skill in the art as evidenced by Butts (column 3, lines 51-60).

Therefore, one of ordinary skill in the art at the time the invention was made would have found it obvious to implement or incorporate Butts's memory storing a TCP connection in Elzur's device in order to read and write information from/to the socket.

As per claim 4, Elzur discloses the interface device of claim 1, further comprising a Fibre Channel controller connectable to the storage unit (column 3, lines 46-60).

As per claim 21, Elzur discloses an interface device for a computer, the interface device comprising:

- A receive mechanism that processes a Transmission Control Protocol (TCP) header of a network packet (column 2, lines 43-47, 55-58, 64-67, column 3, lines 1-4);
- A processing mechanism that associates said packet with said information (column 4, lines 20-30, column 5, lines 5-10);
- to send data from said packet via a network port to a storage unit, thereby avoiding the computer (column 5, lines 59-65, column 6, lines 7-10, 42-52).

Elzur does not explicitly disclose:

- A memory storing a TCP connection established by the computer and handled by said device.

However, the use and advantages of storing a TCP connection is well-known to one of ordinary skill in the art as evidenced by Butts (column 3, lines 51-60).

Therefore, one of ordinary skill in the art at the time the invention was made would have found it obvious to implement or incorporate Butts's memory storing a TCP connection in Elzur's device in order to read and write information from/to the socket.

As per claim 23, Elzur discloses the interface of claim 21, further comprising a plurality of network ports (column 4, lines 40-45).

As per claim 28, Elzur discloses a method for operating an interface device for a computer, the interface device connectable to a network and a storage unit, the method comprising:

- Receiving, by the interface device from the network, a packet containing data and a Transmission Control Protocol (TCP) header (column 2, lines 43-47, 55-58, 64-67, column 3, lines 1-4);
- Processing, by the interface device, the TCP header (column 2, lines 43-47, 55-58, 64-67, column 3, lines 1-4);
- Associating, by the interface device, the packet with the TCP connection (column 4, lines 20-30, column 5, lines 5-10);

- Selecting, by the interface device, whether to process the packet by the computer or to send the data from the packet to the storage unit, thereby avoiding the computer (column 5, lines 59-65, column 6, lines 7-10, 42-52).

Elzur does not explicitly disclose:

- A memory storing a TCP connection established by the computer and handled by said device.

However, the use and advantages of storing a TCP connection is well-known to one of ordinary skill in the art as evidenced by Butts (column 3, lines 51-60).

Therefore, one of ordinary skill in the art at the time the invention was made would have found it obvious to implement or incorporate Butts's memory storing a TCP connection in Elzur's device in order to read and write information from/to the socket.

As per claim 29, Elzur discloses the method of claim 28, further comprising creating, by the computer, the information regarding the TCP connection (column 4, lines 35-50).

As per claim 30, Elzur discloses the method of claim 28, wherein the packet is received via the port and the data is sent to the storage unit via the port (column 4, lines 43-45, column 6, lines 49-50, column 11, lines 28-30).

As per claim 31, Elzur discloses the method of claim 28, wherein the interface device includes first and second network ports, and the packet is received via the first

port and the data is sent to the storage unit via the second port (column 4, lines 43-45, column 6, lines 49-50, column 11, lines 28-30).

As per claim 33, Elzur discloses the method of claim 28, further comprising adding a network protocol header to the data for sending the data to the storage unit (column 7, lines 35-49).

3. Claims 2, 5, 22, 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Elzur (US Patent 6,427,169 B1) in view of Butts et al. (hereinafter "Butts", US Patent 6,233,543 B1) and further in view of Day et al. (hereinafter "Day", US Patent 6065096).

As per claims 2 and 22, Elzur, in view of Butts, discloses the interface device of claims 1 and 21.

Elzur, in view of Butts, does not explicitly disclose the interface further comprising a SCSI controller connectable to the storage unit.

However, Day discloses SCSI interface channels attached to disk drives (column 2, lines 40-54, column 5, lines 1-25).

Therefore, one of ordinary skill in the art at the time the invention was made would have found it obvious to implement or incorporate in Day's interface comprising a SCSI controller in Elzur's device in order to provide for a simple, lower cost RAID

controller architecture to enable lower cost and complexity associated with high performance and high reliability storage subsystems.

As per claims 5 and 25, Elzur, in view of Butts, discloses the network interface device of claims 1 and 21.

Elzur, in view of Butts, does not explicitly disclose the interface further comprising a RAID controller connectable to the storage unit.

However, Day discloses a RAID controller that integrates onto a single integrated circuit of a general-purpose processor (column 2, lines 11-25, 55-67).

Therefore, one of ordinary skill in the art at the time the invention was made would have found it obvious to implement or incorporate Day's interface comprising a RAID controller in Elzur's device allowing the disk interface connections and protocols to be more flexibly selected but at the cost of less integration within the circuit.

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Elzur (US Patent 6,427,169 B1) in view of Butts et al. (hereinafter "Butts", US Patent 6,233,543 B1) and further in view of Cox et al. (hereinafter "Cox", US Patent 6,172,981 B1).

As per claim 3, Elzur, in view of Butts, does not explicitly disclose the interface device of claim 1, wherein said first network port is connected to a first network and said second network port is connected to a second network.

However, in an analogous art, Cox teaches a switch that provides connection between different networks. The switch transmits data bits received from the source

port directly to the destination port. It reads the network layer protocol header in a data frame, and if destined for a station on a different LAN segment, it transmits to the destination end station (Abstract, column 1, lines 63-67, column 2, lines 1-5, 15-20, column 4, lines 3-8, column 5, lines 3-12).

Therefore, one of ordinary skill in the art at the time the invention was made would have found it obvious to implement or incorporate Cox's ports on first and second networks in Elzur's device avoiding and eliminating delays by forwarding of data without storing the entire frame.

5. Claims 6-7, 24, 26-27, 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Elzur (US Patent 6,427,169 B1) in view of Butts et al. (hereinafter "Butts", US Patent 6,233,543 B1) and further in view of Muller et al. (hereinafter "Muller", US Patent 6,453,360 B1).

As per claim 6, Elzur, in view of Butts, does not explicitly disclose the network interface device of claim 1, further comprising a file cache adapted to store said data.

However, the use and advantages for using such cache is well-known to one of ordinary skill in the art as evidenced by Muller (column 56, lines 20-30, column 58, lines 26-30).

Therefore, one of ordinary skill in the art at the time the invention was made would have found it obvious to implement or incorporate Muller's file cache in Elzur's device in order to store non-assembled packets.

As per claim 7, Elzur, in view of Butts, does not explicitly disclose further discloses the network interface device of claim 1, further comprising a file cache adapted to store said data under control of a file system in the host.

However, the use and advantages for using such cache is well-known to one of ordinary skill in the art as evidenced by Muller (column 56, lines 20-30, column 58, lines 26-30).

Therefore, one of ordinary skill in the art at the time the invention was made would have found it obvious to implement or incorporate Muller's file cache in Elzur's device in order to store non-assembled packets.

As per claim 24, Elzur, in view of Butts, does not explicitly disclose the interface device of claim 21, further comprising a file cache adapted to store said data.

However, the use and advantages for using such cache is well-known to one of ordinary skill in the art as evidenced by Muller (column 56, lines 20-30, column 58, lines 26-30).

Therefore, one of ordinary skill in the art at the time the invention was made would have found it obvious to implement or incorporate Muller's file cache in Elzur's device in order to store non-assembled packets.

As per claim 26, Elzur, in view of Butts, does not explicitly disclose the network interface of claim 21, further comprising a file cache adapted to store said data.

However, the use and advantages for using such cache is well-known to one of ordinary skill in the art as evidenced by Muller (column 56, lines 20-30, column 58, lines 26-30).

Therefore, one of ordinary skill in the art at the time the invention was made would have found it obvious to implement or incorporate Muller's file cache in Elzur's device in order to store non-assembled packets.

As per claim 27, Elzur, in view of Butts, does not explicitly disclose the network device of claim 21, further comprising a file cache adapted to store said data under control of a file system in the computer.

However, the use and advantages for using such cache is well-known to one of ordinary skill in the art as evidenced by Muller (column 56, lines 20-30, column 58, lines 26-30).

Therefore, one of ordinary skill in the art at the time the invention was made would have found it obvious to implement or incorporate Muller's file cache in Elzur's device in order to store non-assembled packets.

As per claim 32, Elzur, in view of Butts, does not explicitly disclose the method of claim 28, further comprising storing the data on a file cache of the interface device.

However, the use and advantages for using such cache is well-known to one of ordinary skill in the art as evidenced by Muller (column 56, lines 20-30, column 58, lines 26-30).

Therefore, one of ordinary skill in the art at the time the invention was made would have found it obvious to implement or incorporate Muller's file cache in Elzur's device in order to store non-assembled packets.

Response to Arguments

1. Applicant's arguments filed have been fully considered but they are not persuasive.

The Office notes the following argument(s)

- (a) Elzur lacks "hardware" configured to receive and process packets.
- (b) "First and second network port" is absent from Elzur.
- (c) "Computer" and "storage unit" are absent from Elzur.
- (d) Examiner is requested to explain how the computer is avoided.
- (e) Absent from Butts is a TCP connection stored on the device was established by the computer.
- (f) There is simply no Fibre Channel controller connectable to the storage unit.
- (g) Elzur does not disclose adding a network protocol header to the data for sending to storage unit.
- (h) Muller does not disclose a file cache adapted to store data on an interface device.

In response to:

- (a) Elzur teaches transmitting packets between a server and client. The processor (hardware) of the client causes the client to execute software to parse the header of the

received packet. The client is a computer system (hardware) that receives a packet and uses a network controller to extract header characteristics. The network controller may also include hardware (column 1, lines 5-10, column 2, lines 43-46, 55-60, column 3, lines 5-7, column 4, lines 6-7).

Therefore, Elzur indeed and explicitly discloses hardware configured to receive and process packets.

(b) It is known that a port is an interface on a computer to which you can connect a device. Computers have various types of ports. Internally, there are several ports for connecting disk drives, display screens, and keyboards. Externally, computers have ports for connecting modems, printers, mice, and other peripheral devices.

According to Elzur, the computer system has various ports connecting to keyboard, display, peripheral device, and memory. A PCI interface is used to transfer data portions of the packets received by the client into buffers. Therefore, the data is sent via the PCI interface to the buffer (column 2, lines 65-67, column 3, lines 5-12, column 4, lines 2-5, column 5, lines 14-20, 45-55, column 7, lines 6-15, Figures 4 and 5).

Elzur further teaches the packets including TCP protocol header indicating a TCP destination port and a TCP source port (column 1, lines 58-60, 66-67, column 2, lines 1-2, column 4, lines 42-45).

Therefore, Elzur undoubtedly teaches first and second network ports.

(c) Elzur teaches a computer system receiving a packet that includes a header. The computer system includes a processor and a peripheral device (column 2, lines 55-57, column 3, lines 5-7, 46-50).

Elzur further teaches a memory (storage unit) used for storing flow tuples and information fields associated with a particular flow. Elzur also teaches a memory buffer (storage unit) used to store data portions copied by the zero copy parser (column 4, lines 61-67, column 5, lines 63-65, column 6, lines 8-10, 43-45).

Therefore, Elzur explicitly discloses a computer and storage unit.

(d) Elzur teaches a computer system receiving a packet including a header. The header is parsed to extract characteristic information (control information) and based on this information (control information), it is determined whether the packet should be processed by the computer system or transferred directly to a memory buffer (avoiding the computer). The packet may bypass execution of certain software on the computer system and sent directly to the memory buffer (avoiding the computer) (column 3, lines 1-4, 61-67, column 4, lines 61-67, column 5, lines 59-66, column 6, lines 7-10, 18-20, 43-45). The claim limitation states "associating said packet with control information to send data from said packet via a second network port to a storage unit, thereby avoiding the computer" so the packet is not processed.

Avoiding the computer results in the packet not being processed.

Therefore, Elzur undoubtedly discloses avoiding the computer.

(e) Outside the teachings of Butts, Elzur also teaches a memory storing flow tuples associated with TCP connection (column 1, lines 8-9, column 4, lines 20-23, 33-36, 61-67).

Therefore, the combination of Elzur and Butts indeed discloses a TCP connection stored on the device was established by the computer.

(f) Elzur teaches a network controller used to parse and extract header information from received packets (column 2, lines 58-61, column 3, lines 65-67, column 4, lines 6-10).

(g) Elzur teaches the zero copy parser determines the exact memory address to store the data. This address becomes the destination address (column 6, lines 43-51, column 9, lines 5-8).

Therefore, Elzur discloses adding a network protocol header to the data for sending to storage unit.

(h) Muller teaches a plurality of caches used to store data packets in a high performance network interface before transferring to a host system (Abstract, column 56, lines 20-30, column 58, lines 26-30).

Therefore, the combination of Elzur and Muller indeed discloses a file cache adapted to store data on an interface device.

Examiner's Notes:

It seems there may be a 112, 2nd paragraph lack of antecedent basis issue in claim 1.

The claim states "associating said packet with *said control information...*". However, it

is unclear as to what "control information" the packet is being associated. Clarification may be necessary.

Conclusion

2. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BARBARA BURGESS whose telephone number is (571)272-3996. The examiner can normally be reached on M-F (8:00am-4:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ario Etienne can be reached on (571) 272-4001. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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December 3, 2011

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